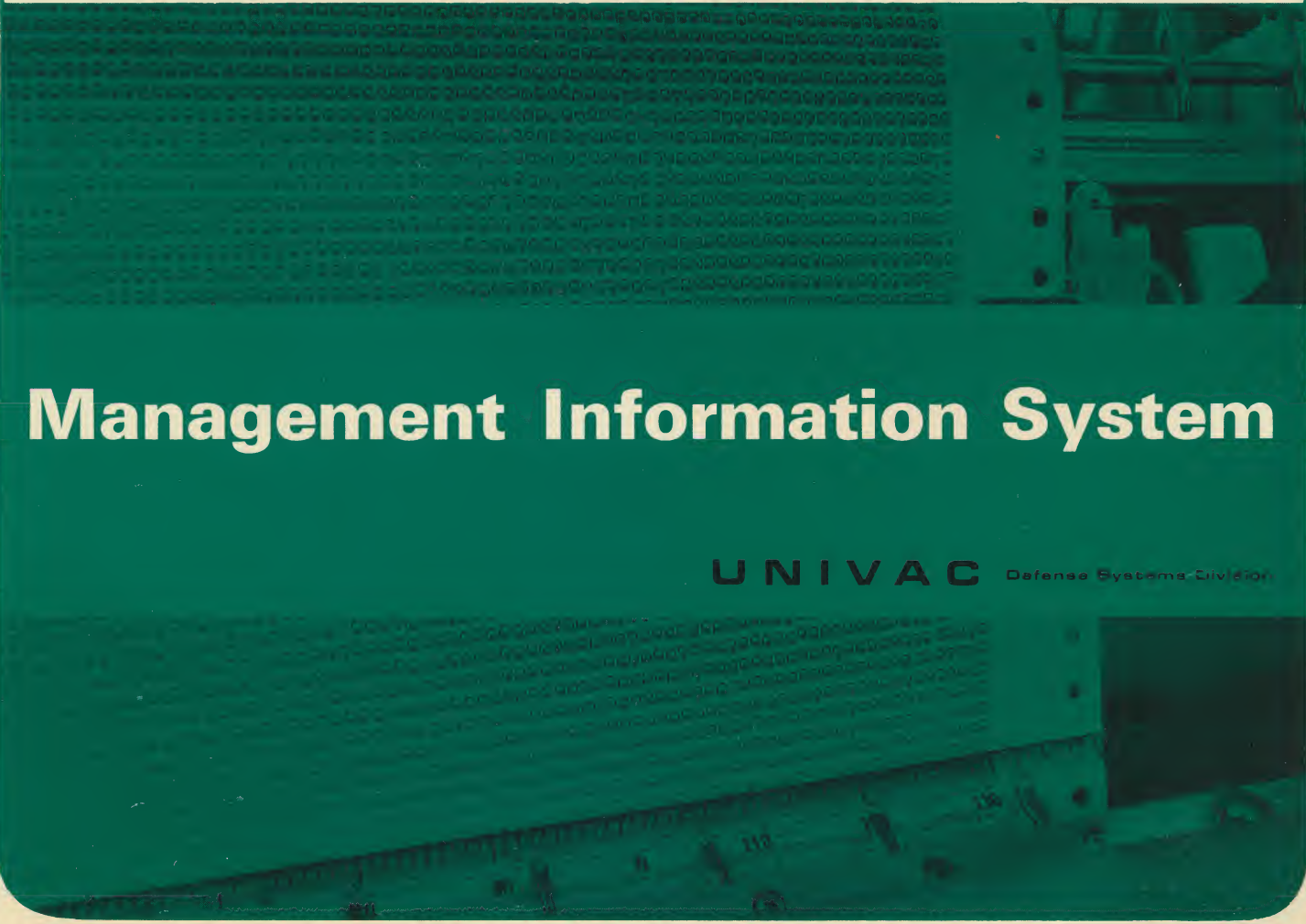




Management Information System

UNIVAC Defense Systems Division





Management Information System

UNIVAC Defense Systems Division

The diagram illustrates the configuration of the UNIVAC Management Information System. It features five main components and their interconnections:

- UNIVAC 1218 CENTRAL PROCESSOR**: A tall, narrow cabinet on the left.
- UNIVAC MAGNETIC TAPE AND CONTROL UNIT**: A large cabinet on the top right.
- UNIVAC 1549 CARD-READER-PUNCH INTERPRETER**: A cabinet in the bottom left with a list of functions:
 - Computer interface logic
 - Keyboard printer control and interface logic
 - Card R.P.I. control logic
 - 256-character memory
 - HSP control and interface logic
- UNIVAC 1533 KEYBOARD AND PRINTER**: A small unit in the bottom center.
- UNIVAC 1549 HIGH-SPEED PRINTER**: A large, wide cabinet on the bottom right.

Connections are shown as follows:

- A single line connects the **UNIVAC 1218 CENTRAL PROCESSOR** to the **UNIVAC MAGNETIC TAPE AND CONTROL UNIT**.
- Three lines originate from the **UNIVAC 1218 CENTRAL PROCESSOR** and connect to the **UNIVAC 1549 CARD-READER-PUNCH INTERPRETER**, labeled:
 - Channel 3 Control Lines
 - Data Lines
 - Channel 1 Control Lines
- A single line connects the **UNIVAC 1533 KEYBOARD AND PRINTER** to the **UNIVAC 1549 CARD-READER-PUNCH INTERPRETER**.
- A single line connects the **UNIVAC 1549 CARD-READER-PUNCH INTERPRETER** to the **UNIVAC 1549 HIGH-SPEED PRINTER**.

The UNIVAC 1500, the first management information system to be developed from a class of militarized real-time hardware, has unrivalled input/output characteristics which satisfy the requirements for rapid, accurate transfer of data between storage media, input of base and variable data, and output of processed data (e.g., microseconds conserved in the input/output transfer of one data word add up to hours saved during each week of daily data processing).

The entire MIS Configuration is designed and built using the same components, cabinets and manufacturing techniques. Each cabinet in the 1500 System is of rigid aluminum construction employing sandwich structure side panels with a corrugated aluminum core. Front and back frames consist of a weldment of aluminum angles and extrusions which are attached to the side panel by blind pressnuts and screws. The result is a rigid box-beam structure that is highly resistant to shock and vibration. Top, bottom, and rear aluminum skin is attached to the structure by corrosion-resistant steel screws. RFI gaskets are used at all facing surfaces. This type of cabinet structure has been used by UNIVAC on similar equipment, and has successfully passed the shock and vibration tests of MIL-E-16400.

*A communications and inventory control system for recording and processing operational data. Problem areas are isolated for higher level decision making and pertinent information reports are presented to top management to reflect the progress or lack of progress made in achieving major objectives and to assist them in planning operations.

SYSTEM CONFIGURATION

The center of the UNIVAC *MIS* is a UNIVAC 1218 Military Computer, functioning as a central processor. Modular peripherals include a card reader-punch which provides card reading, punching and printing facilities, a keyboard page printer for system monitoring and operator entry, a high-speed printer for quantity printing, and a 4-handler magnetic tape unit for large storage and fast input and output of data.

The computer controls and works in conjunction with the system peripherals attached to three of its input and output channels. Direct communication exists with the magnetic tape unit of four tape handlers. Two computer channels communicate with the UNIVAC 1549 Card Reader-Punch-Interpreter. The 1549 cabinet contains the card equipment, control unit, and 256-character memory, which provide functional control and buffer memory for both the high-speed printer and the card equipment. The 1549 cabinet also contains the logic and control for the keyboard and page printer. The UNIVAC 1569 High-Speed Printer is a separate cabinet containing the 450-line-per-minute printing mechanism and its associated electronics. The hardware configuration of the *MIS* is shown in the block diagram.

SYSTEM FLEXIBILITY

Expandability in the areas of input/output channels and memory size allows the capability and capacity of the *MIS* to be tailored to the specific application. Up to eight fully buffered input and eight fully buffered output channels can be provided for the *MIS* computer. Memory sizes can be increased up to 32K words of high-speed core storage.

SYSTEM APPLICATIONS

In the environments mentioned, the *MIS* system is designed for applications which involve updating of one or more large data bases. These data bases may represent inventory files, parts lists, personnel records, satellite catalogs, dispatching orders, calibration tables, etc. As changes are made to the data bases in the form of additions, deletions, or changes to specific items of data, these



changes can be sorted and merged with the old base remitting in a base of current data. This process can then generate useful outputs such as economic order quantities, dispatching orders, personnel assignments, machine schedules, etc.

The following system applications generate data bases of sufficient sizes and complexities (with corresponding periodic transactions) to be effectively accommodated and processed by an *MIS*.

- Maintenance Scheduling
- Information Search and Retrieval
- Personnel Evaluation and Rating
- Supply Accounting
- Dispatching
- Warehouse Functions
- Data Storage and Forwarding
- Mobile Supply Depots
- Logistics
- Seismic Data Cataloging and Analysis
- Oceanographic Research
- Satellite Cataloging
- Management Accounting
- Force Allocations
- Economic Order Quantity System
- Payroll
- Machine Scheduling



SYSTEM SOFTWARE

A complete software system has been developed specifically for this system including an Assembler, Utility Programs and program testing aids, a generalized Sort/Merge Program, and Input/Output Routines for each peripheral device, all under control of a sophisticated Executive System.

The Executive System relieves the working program of housekeeping chores and controls the allocation of facilities in the processing environment. The Executive is modular in construction, permitting expansion, replacement of peripherals, and addition of new peripherals. New routines may be added without altering the Executive System. The data-processing oriented Assembler accepts symbolic input coding and produces UNIVAC *MIS* object coding on a desired input medium and a side-by-side listing of the symbolic program with the object program by the

high-speed printer. The *Input and Output Routines* provide the user with a working package for incorporating his generated programs on the equipment in the system or for a future expanded system. *Sort/Merge Routines* are useful in sorting and rearranging large quantities of data into desired formats. The *Utility and Debugging Packages* provide program handling and correction facilities during the generation stages of system programming and for maintenance purposes.

The flexibility of the system hardware together with the versatility of the *MIS* software allows rapid implementation of new management information systems and economic modernization of operating systems. Real-Time tasks can be incorporated into operating systems on an exclusive or time-shared basis.

SYSTEM HARDWARE CHARACTERISTICS

The following Military Specifications guided the design of the 1500 System units:

SPECIFICATIONS

General Requirements — MIL-E-16400E
Shock — MIL-S-901B
Vibration — MIL-STD-167, Type I
Salt Spray — MIL-STD-202, Condition A
Enclosure — MIL-STD-108 (fog proof)
Temperature — MIL-E-16400 (0 to 50°C)
Humidity — MIL-E-16400
(20 to 85% cycle)
Interference — MIL-I-16910A

MAINTENANCE

The solid-state, plug-in modules, in conjunction with the manual controls and register and logic indicators, simplify the maintenance of the UNIVAC equipment and reduce repair time to a minimum. Manual controls permit off-line maintenance of peripheral devices during on-line operation of other units in the system. The components are mounted on small, plug-in, printed-circuit cards which are assembled in a modular form for compactness. This building block technique, and the circuit cards utilized in the console, have a field-proven record of reliability in UNIVAC computers and peripheral equipment. All internal components are accessible from the front of the cabinet. The logic chassis is mounted on a pull-out drawer. The chassis is wire-wrapped for economy of production and reliability.

RELIABILITY

The Reliability Goals in Mean-Time-Between Failures (MTBF) of the 1500 System and various units in the system are specified below:

UNIT	MTBF
System	277 Hours
1218 Computer	7685 Hours
1240 Magnetic Tape	650 Hours
1533 Input-Output Unit	1500 Hours†
1549 Card Processor	1780 Hours
1569 High-Speed Printer	1413 Hours§

These MTBF's are calculated using the basic formula:

$$\text{MTBF hours} = \frac{1}{\frac{\text{Sum of the failure rates*}}{\left(\frac{\text{failures}}{\text{hours}}\right) \text{ of all components}}}$$

ENVIRONMENTAL REQUIREMENTS

All units of the UNIVAC 1500 MIS are designed to operate in the following environment:

Temperature 50°F to 90°F; Relative Humidity 20 to 85 percent.

The entire system utilizes ambient room air for cooling and dissipates approximately 26,138 BTU per hour at 75°F.

†Vendor Furnished MTBF Figure.

§Includes a 2000 hour MTBF Vendor Furnished Figure.

*Failure rates are based on known circuit card failure rates and data supplied from the vendors of the electromechanical assemblies. The data on the Soroban Punched Card Unit electromechanical assemblies based on extensive actual field experience with similar assemblies.

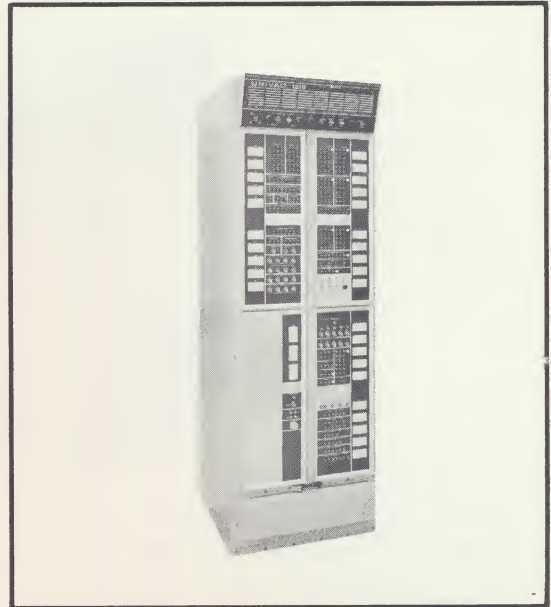


UNIVAC 1218 MIS COMPUTER

The UNIVAC[®] 1218 MIS Computer is a versatile, stored-program, medium-scale, general-purpose, digital computer specifically designed to provide high reliability under adverse operational environments. With its high internal operating speed, core memory cycle time of four microseconds, and four flexible input/output channels, the UNIVAC MIS Computer is capable of processing large quantities of data. Arithmetic operations can be performed on the basis of a single-length, 18-bit word or a double-length, 36-bit word, if required for greater precision. The repertoire of 98 instructions allows complete programming freedom in mathematical and logical computations, as well as full control of the input/output operations. The conventional single address instructions, programmed by simple mnemonics (i.e., abbreviated English in symbolic terms) simplifies programming and does not require absolute coding. The computer features parallel transfers, one's complement binary arithmetic, direct addressing, and program controlled automatic address or operand modification via eight memory-contained index registers.

The UNIVAC MIS Central Processor has a 12K memory, and four input, and four output channels. The processor contains one buffer register for the four output channels numbered 1, 3, 5 and 7. The higher numbered channels are given preference over the lower numbered channels in case of simultaneous requests for the same type of operation. Input and output communication alternates if both types of requests exist simultaneously.

A single input cable and a single output cable are used for Channels 1 and 3 since both connect to the 1549 cabinet. The Channel 1 control lines of the cables control the logic for the keyboard and printer, and the Channel 3 control lines control the logic for the card equipment and the high-speed printer. The information (data and command code) lines are common to both channels. The computer Input Channel 7 and Output Channel 7 are spares for system expansion. The two cables for Channel 5 input and output are connected to the UNIVAC magnetic tape unit control.



The input data and input control lines are contained in the input cable, and the output data and output control lines are contained in the output cable. Internal interrupts are generated by the Input/Output Section of the computer whenever a buffer, with a monitor imposed, terminates. A fault interrupt is caused by executing a meaningless function code.

The Control Section contains circuitry necessary to procure, modify, and execute the single address instructions of a program stored in the core memory of the computer. This section controls all arithmetic, logical, and sequential operations of the computer except those assigned to the Input/Output Section. It permits interruption of the running program when certain real-time events require such interventions. The Arithmetic Section performs all the arithmetic and logical operations for the computer under direction of the Function Code Translator and input/output control.

UNIVAC 1218 MIS COMPUTER



CHARACTERISTICS

TYPE

General-purpose, medium-scale, solid-state, parallel, binary

MEMORY

Magnetic core — 12,288 words
4-microsecond read-write cycle time
18-bit word length, parallel transfers
Thirty-two words of NDRO storage are provided for automatic program recovery and initial input routine.

ARITHMETIC

Registers: Two 18-bit, addressable
Functions: Arithmetic operations including double-length add and subtract, logical, and bit manipulation
Instruction execution time averages about 12 microseconds

CONTROL

Instruction Organization: Single address
Address Modification: Via eight memory contained Index Registers

POWER REQUIREMENTS

maximum
115 volt, ± 10 , 1-phase, 60-cps, 150 watts,
maximum
115 volt, ± 10 , 3-phase, 400-cps, 1500 watts,

INPUT/OUTPUT

Channels: Four input and four output channels are available. Each channel provides 18 parallel data lines plus the necessary control lines.

Buffered Transfers: All input/output transfers are fully buffered, do not require program attention, and operate asynchronously at the rate required by the external device. Control words guide the active buffers by defining the memory location, buffer direction, and monitor.

Intercomputer Channel: 18-bit parallel data transfers allow communication with other UNIVAC 1218 Computers (direct cable connection).

Maximum Input/Output Transfer Time:

Rate: 100K 18-bit words per second
16 microseconds per 18-bit word (input or output)

Interrupts: 16 unique interrupts are provided for external and internal real-time functions.

Program Control: Eighteen program instructions are devoted to the control of input/output, providing positive control and a high degree of sophistication in programming.

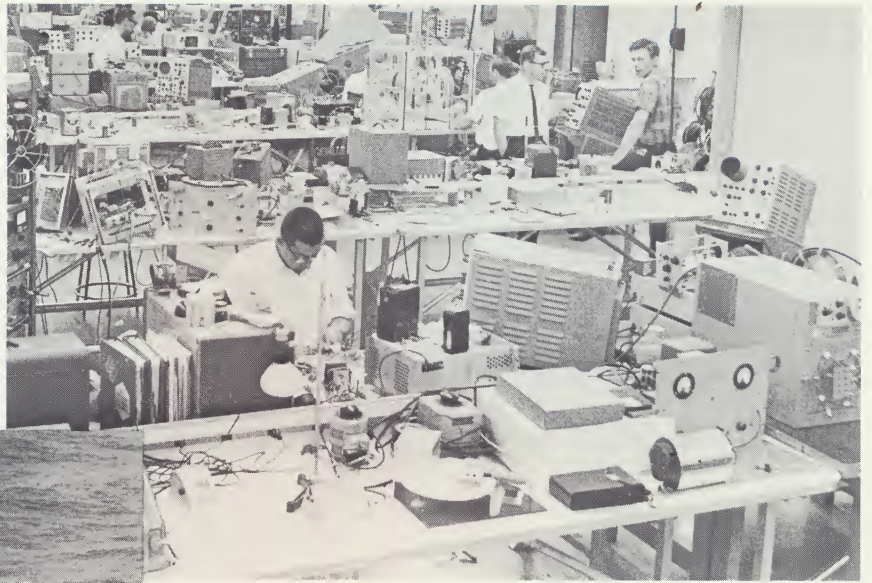
UNIVAC 1533 INPUT/OUTPUT KEYBOARD-PRINTER



The UNIVAC® 1533 Input/Output Keyboard-Printer consists of a Model 35 Teletype page printer and alphanumeric keyboard assembled into a compact unit which operates on a single input/output channel. Alphanumeric entries to the computer may be made at the keyboard with printout. The page printer is also useful as a program or system monitoring device in providing a running record of the MIS U1500 activities.

The UNIVAC 1533 Keyboard-Printer operates under the control of the computer program. It accepts instructions from the computer via the Card Read Punch Interpreter control circuitry for any function or combination of functions assigned to it. The control circuitry translates the function word to initiate the proper mechanical and electronic response and executes the operations designated. Data are transferred in seven bit frames from the alphanumeric keyboard to the computer and are accepted in seven bit frames from the computer for output on the printer. The control circuitry supplies the necessary communication signals required between the keyboard-printer and the computer to complete an input/output buffer without program attention. Keyboard interruption of the computer program is also provided. The UNIVAC 1533 Keyboard-Printer may be operated off-line to print information.

UNIVAC 1533 INPUT/OUTPUT KEYBOARD-PRINTER



CHARACTERISTICS

FUNCTIONAL

Printing Speed: 10 characters per second
Keyboard Input: Printed for all operations
Keyboard Generated Codes: ASCII
Printer Response Codes: ASCII
Printing Format (10 characters per second printer) :

Characters per line: 72
Characters per inch, horizontal: 10
Lines per inch, vertical: 6

PHYSICAL

Paper Form Width: 8½ inches

Cooling: Ambient Room Air

Heat Dissipation: 854 BTU/Hr. at 75°F

PHYSICAL SIZE:

Height: 13.28 inches
Width: 19.75 inches
Depth: 24.26 inches
Weight: 50 pounds
Volume: 3.68 cubic feet

Power (supplied by 1549 CRPI)

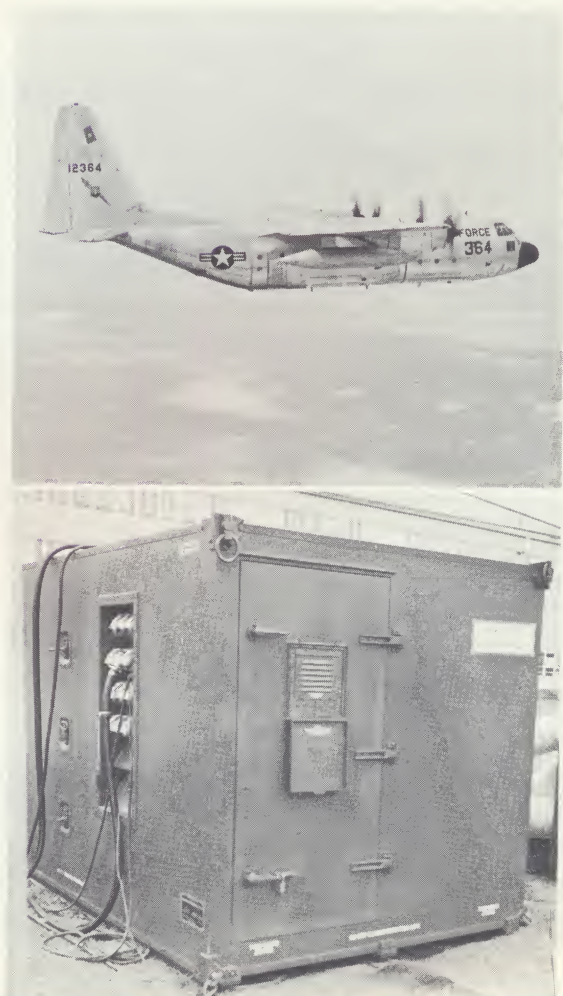
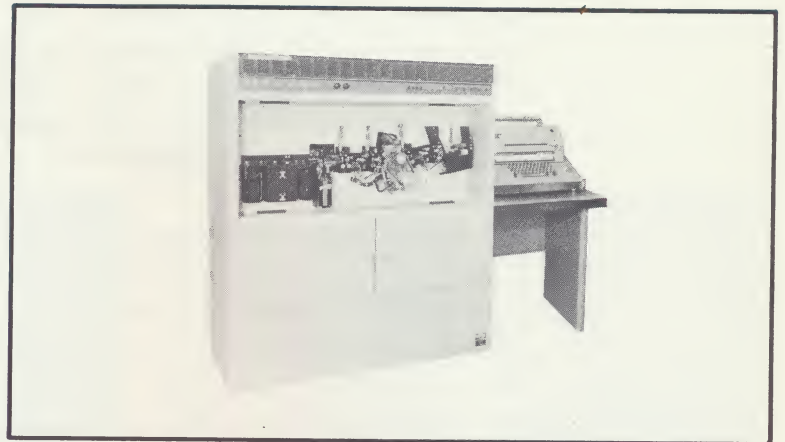
60 cycle — 115 volt $\pm$ 10 percent,
single phase, 60 cycle $\pm$ 5 percent,
250 watts maximum

UNIVAC 1549 CARD READER-PUNCH-INTERPRETER

The UNIVAC® 1549 Card Reader-Punch-Interpreter provides the required card reading, punching, and interpreting for the UNIVAC MIS. Although an input and an output device, the Card Reader-Punch unit is the primary means of entering data for storage and for retrieving data from storage.

Physically, the Card Reader-Punch-Interpreter cabinet has two major units: a common control unit and the punched card unit itself. The common control unit contains the computer interface and control logic for the keyboard-printer, high-speed printer, and the reader-punch-interpreter. A 256-word core memory provides the necessary buffer requirements for the card equipment and the high-speed printer. The card unit provides the card reading assembly, the card punching assembly, the printing assembly, associated drive circuitry, card feed, and output hoppers. The card processing heads are mounted rigidly in the cabinet. Electronic chassis and power supply chassis in the card unit cabinet are each mounted to provide front access for all maintenance and repair. All functional operations can be performed with front access.

The input card hopper and the two output stackers each have a capacity of 500 cards. The unit has dual photoelectric detectors and; under computer control, rejects mis-punched cards into a special hopper. Card operation is initiated by the control unit or by the computer. In either case, the computer will send an External Function indicating the type of operation to be performed. Cards are transported through the read, punch, post punch read, interpreter (printer), and stacker stations in serial order, lengthwise. Each operation or combination of operations to be performed by the five stations and card movement is controlled by commands from the computer. This command word is the first word of a computer output buffer for output functions and a single word buffer for others. Each card is read column-by-column photoelectrically at the read station. These data



UNIVAC 1549 CARD READER-PUNCH-INTERPRETER

are stored in the buffer memory until the entire card is read, then the data are transferred to the computer in either XS-3 or binary format as dictated by the command word. The computer transfers XS-3 or binary coded data to the 1549 unit where they are stored in the buffer memory. When the card to be punched is in position, the first four words of information (in the form of Hollerith or binary code) are transferred from the buffer to the punch. This transfer of information is repeated until the card is completely punched. The punched card is

then transported to a post-punch read station where it is read and verified. The interpreter station prints the contents of the card in a required format. Normally the card will be read at the reading station, the data will be translated for the code and format, then sent to the interpreter in 6-bit characters for printing on the card. The format will consist of two lines of 60 characters each. The interpret operation is controlled by a switch located on the 1549 control panel. In the On position all cards that are being read or read and punched will be interpreted.

CHARACTERISTICS

FUNCTIONAL

Card Punching Speed — 200 cards per minute minimum

Card Reading Speed — 400 cards per minute minimum

Card Printing Speed — 60 cards per minute minimum

Input Hopper Capacity — 500 cards minimum

Output Stacker Capacity — 500 cards minimum

Card Size — 3.250 inch x 7.375 inch — 80 column

Hole Size and Shape — EIA Standard Rectangular

Reading Method — Photoelectric

Punching — Paper or plastic cards

Number of Stackers — 2

Card Printer Code — XS3

Card Printer Type Font Size — 0.090 inch high x 0.062 inch wide, 60 characters per line on each of two lines

Card Punching Verification — Post punch read

Card Printing Method — Print hammer strikes against drum containing 63 printable symbols and characters

BUFFER MEMORY

Type — Magnetic Core

Read-Write Cycle Time — 4 microseconds

Word Length — 12 bits

Size — 256 Decimal Words

Cooling — Ambient Air

Heat Dissipation — 4445 BTU/Hr. at 75°F

SIZE:

Height — 65 inches

Width — 62 inches

Depth — 24.5 inches

Weight — 800 lbs.

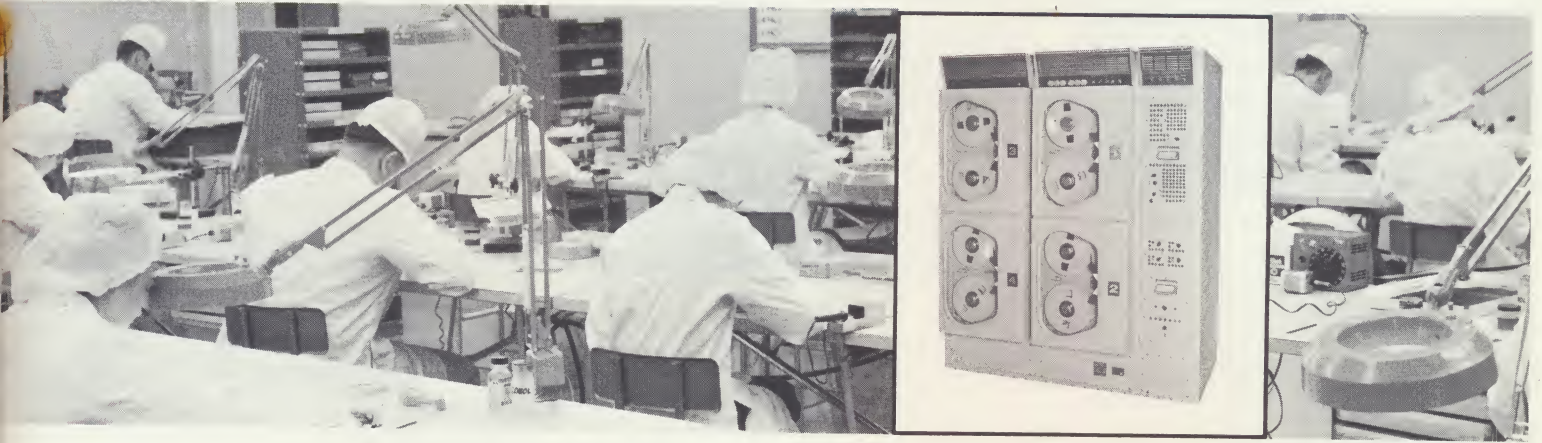
Volume — 55.85 Cubic Feet

POWER REQUIREMENTS

400 Cycle Power — 115V $\pm$ 5 percent, 3 phase, 400 cycle $\pm$ 5 percent, 450 watts maximum

60 Cycle Power — 115V $\pm$ 10 percent, single phase, 60 cycle $\pm$ 5 percent, 850 watts maximum

UNIVAC 1240 MAGNETIC TAPE UNIT

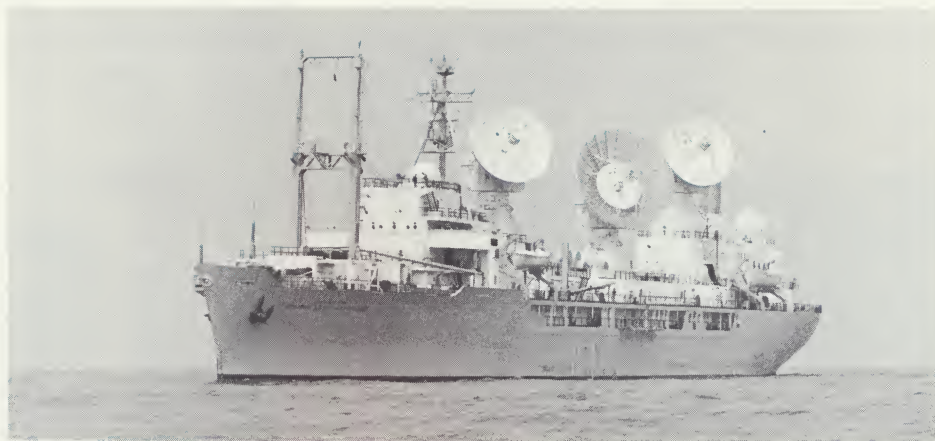


The UNIVAC® 1240 Magnetic Tape Unit is a versatile, large-capacity, auxiliary storage device. Its characteristics provide an efficient method for reliable and fast manipulation of digital information. The unit is available with from two to 16 tape handlers (the MIS utilizes a four-handler unit, however), operating with a single computer input/output channel. Designed to military standards, its modern electronics and rugged construction permit operation under severe environmental conditions. The 1240 is another product of established UNIVAC engineering and production techniques which have resulted in equipment that is recognized for its unexcelled reliability. The UNIVAC 1240 may be used with all UNIVAC general-purpose military computers. It operates at a maximum transfer rate of 62.5 K characters per second and is compatible with industry accepted format and recording density.

The UNIVAC 1240 Magnetic Tape Unit operates completely under the control of the

computer program. The main control logic accepts instruction words from the computer and translates these coded words to select the transport, direction of tape motion, format and density, and operation to be performed. Assembly or disassembly of 18-bit computer words, comprising six-bit characters, is performed as directed by the instructions. The UNIVAC 1240 also provides a "read-after-write" function to ensure correct data recording. The UNIVAC 1240 Magnetic Tape Unit apprises the computer program of its status by means of a Status Interrupt at the completion of every function requested by the program instructions. This permits the computer program to determine successful completion of the function, or if not successfully completed, the resultant improper condition. In addition to the conventional tape unit features mentioned above, the UNIVAC 1240 also provides the capability for searching a file or the tape (forward or backward) for desired information.

UNIVAC 1240 MAGNETIC TAPE UNIT



CHARACTERISTICS

TAPE

Width: 1/2 inch

Type: "A" wound (oxide coating on inside of tape) — Mylar base

Length: 2400 feet or 3600 feet

Reels: 10 1/2 inch, compatible hub type

Tape: Markers Load Point and End of Tape reflective markers

TAPE SPEED

Read/Write: 112.5 inches per second

Rewind: 225 inches per second

Start/Stop: Time 1.5 to 2.5 milliseconds

RECORDING TECHNIQUES

Non-Return to Zero: (change-on-one)

Seven Tracks: Six data bits, one parity bit

Density: 200 or 555.5 frames per inch
(Program Controlled)

Inter-Record Gap: 3/4 inch

Extended Inter-Record Gap: 3 1/2 inches

Record Length: Variable

Parity: Lateral and Longitudinal

Tape Mark: End of File (Program Controlled)

TRANSFER RATE

62,500 characters per second: High Density

22,500 characters per second: Low Density

FORMAT (PROGRAM CONTROLLED)

Frame Character: Biocatal or Redundant Octal

Parity: Odd or Even

Modulus: 3

TAPE COMPATIBILITY

Transport to Transport

Other compatible systems

PHYSICAL

SIZE:

Height: 72 inches

Width: 60 inches (4 tape transports)

Depth: 30 inches

WEIGHT:

1900 pounds (4 tape transports)

COOLING:

Ambient Air: 1400 CFM (4 transports)

Over Temp. Alarm: 115°F

Over Temp. Turn Off: 140°F

Heat Dissipation: 13,857 BTU/Hr. at 75°F

POWER

4 Transports

115 Volts, ± 10%, 1 phase,

60 cps, ± 5%

6.8 KW

115 Volts, ± 5%, 3 phase,

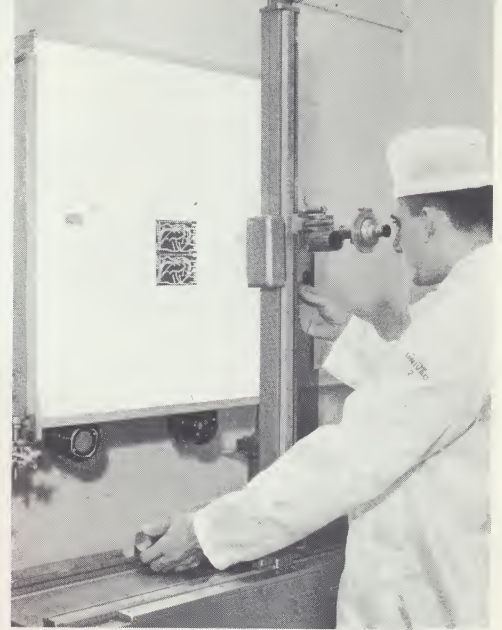
400 cps, Regulated

0.6 KW

The UNIVAC® 1569 High-Speed Printer is the primary means of data output from the UNIVAC *MIS*. It accepts the results of the data processing in the form of digital data from the computer and prints it in alpha-numeric form on multi-copy paper. Physically, the high-speed printer has a common control unit with and in the Reader-Punch-Interpreter cabinet. The common control unit contains all the electronics that control the transfer of data and control information from the computer to the printer and a buffer memory to retain sufficient character data to print one line. The printer cabinet contains the print head assembly, the associated drive electronics, and storage space for paper.

A ruggedized version of the Model 4100 print head produced by Data Products, Inc. is utilized in the 1569 Printer. It consists of a rotating drum upon which all 64 characters are engraved in each of 120 rows around its circumference, a line of 120 hammers (one for each row of characters) with an actuating mechanism for each, inked ribbon and paper moving mechanisms. The printer moves the paper between the inked ribbon and the rotating drum. As each longitudinal line of characters on the rotating drum passes by, the printer actuates the hammers at the positions where that character is to be printed. After one revolution all characters have been printed where required on one line and the paper advances one space. Vertical spacing format, including top-of-form positioning, is controlled by a loop of punched tape mechanically linked to the paper feed tractors. As it advances, a punched tape reader senses the print paper position through the holes in the 8-level tape. "Printing a Line" is initiated by the computer in the form of an output buffer of one command word followed by the coded characters to be printed on that line.

The 1549 Card Reader Punch Interpreter control logic will accept the printer command word, translate its contents and generate the proper control signals for the printer and the request signal for the computer to transfer another word. The computer will transfer an 18-bit (three character codes) word to the control unit which drops the request and stores the characters in the first three buffer



UNIVAC 1569 HIGH-SPEED PRINTER



memory cells. It then requests another word and so on until 120 character positions, representing one line, are loaded in memory. No further requests are presented to the computer, and the print cycle is initiated. The next line of 120 *similar* printable characters, on the rotating print drum, coming into printing position carry with them their unique character code. This code is compared with each of the 120 characters in memory. Where code coincidence occurs, that corresponding character position print hammer is set. When all 120 memory characters are scanned, the hammers are "fired," thereby printing all *similar* characters in the line.

The next row of drum characters which carry a different code are compared in similar manner until all 120 memory locations are scanned and similar characters are printed. This process is repeated until all 64 lines of characters around the circumference of the drum are compared and printed. Upon completion of the print cycle (one line printed), the control unit will respond to a computer command to advance the paper one line space, thus preparing for the next line of print. Printing form control (top of form, bottom form, etc.) is governed by an 8-channel punched tape loop, attached to the paper feed tractors.

UNIVAC 1569 HIGH-SPEED PRINTER

CHARACTERISTICS

FUNCTIONAL

Printing Speed: 600 lines per minute
maximum

450 lines per minute average

Print Format:

Characters per line: 120

Characters per inch horizontal: 10

Liner per inch vertical: 6

Printed Characters: 63 plus space

Paper Width: 17-25/32 inches or 14³/₄ inches

Print Type Font: Open Gothic characters

Printing Method: Print hammer impact
against drum containing 64 characters
in each character position of a line.

Paper Form Length: 22 inches maximum

Paper Slew Rate: 20 inches per second

Vertical Format Control: Punched tape loop

Paper Feed: Pin feed type tractors (four)

Printer Code: XS-3

PHYSICAL

Cooling: Ambient air

Heat Dissipation: 3062 BTU/Hr. at 75°F

SIZE:

Height: 44.8 inches

Width: 64.86 inches

Depth: 27.34 inches

Weight: 750 lbs.

Volume: 46 cubic feet

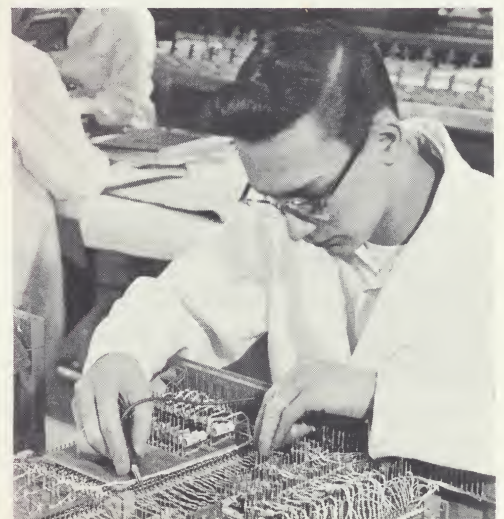
PRIMARY POWER:

60 cycle power—115 V $\pm$ 10 percent,
single phase, 60 cycle $\pm$ 5 percent, 900
watts maximum

OPERATING ENVIRONMENT:

Temperature: 50° to 90°F

Relative Humidity: 20 to 85 percent





UNIVAC

DIVISION OF SPERRY RAND CORPORATION
DEFENSE MARKETING
UNIVAC PARK, ST. PAUL, MINN. 55116
AREA CODE 612, 888-3451

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